REMARKS

Claims 3-4, 6-7, 9, and 18-24 are pending. Reconsideration of the pending claims is respectfully requested in view of the following remarks.

I. REJECTION OF CLAIMS 3-4, 6-7, 9 AND 18-24 UNDER 35 U.S.C. § 103(a)

Claims 3-4, 6-7, 9 and 18-24 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Publication No. 2003/0176073 (Ying et al.) in view of U.S. Patent No. 6,211,035 (Moise et al.). Withdrawal of the rejection is respectfully requested for at least the following reasons.

i. There must be some suggestion or motivation to combine Ying et al. and Moise et al.

In the previous response, arguments were presented that one of ordinary skill in the art would not have been motivated to modify the teachings of Ying et al. in accordance with the teachings of Moise et al. In doing so, arguments were presented that since both references discuss performing stack etches at different temperature ranges, one of ordinary skill in the art would not have been motivated to modify one reference in view of the other. The most recent Office Action dismissed such arguments, stating that such arguments were not persuasive because the actual modification that was proposed was not temperature, but instead dealt with etch chemistry. (O.A., 8/9/06, p. 3, part 3).

Applicant respectfully submits that while temperature is not the variable being modified in the modification of the Ying et al. reference, in order to properly evaluate whether one of ordinary skill in the art would be motivated to modify Ying et al. in view of Moise et al. for any purpose, an evaluation of each reference must be performed ***as a whole***. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1551 (Fed. Cir. 1983). It is respectfully submitted that upon a review of each reference as a whole, one of ordinary skill in the art would not have been motivated to modify Ying et al. in view of Moise et al. In the summary of the invention, Ying et al. state that "to improve etch

rates, the substrate can be heated to a temperature between 250 and 450C, preferably 350C, while etching the electrode and ferroelectric layers." (Ying et al., [0008]). Further, in [0009], Ying et al. state "[a] substrate on which the PZT layer resides is heated to a temperature between 250 and 450C, preferably 350C, while etching the PZT layer." Further, when discussing the details of the stack etch in [0028]-[0032], it states that the DPS reaction chamber is set up for a hot chuck etching process, and that after the stack etch is complete, the underlying barrier is removed by lowering temperature in a final cold chuck etch process. ***Therefore one of ordinary skill in the art would appreciate that an elevated temperature was employed by Ying et al. in order to facilitate high rates.*** In contrast, Moise et al. summarize the stack etch in Col. 10, and state that all the steps involved in etching the stack are carried out at relatively low temperatures (less than 200C) ***with backside wafer cooling***. (Col. 10, lines 33-35). Therefore one of ordinary skill in the art, upon evaluating Moise et al. ***as a whole***, would appreciate that the capacitor stack etch is performed under low temperature conditions.

While the Office Action is not taking the temperature value of Moise et al. to modify Ying et al., but instead is taking the etch chemistry thereof, one of ordinary skill in the art nevertheless considers the teachings of each reference ***in their entirety*** in evaluating whether it would be reasonable to modify one reference in light of another. Furthermore, ***the fact that each reference specifically sets forth a disparate temperature range in their disclosure bears directly upon whether one of ordinary skill in the art would believe that there is a reasonable expectation of success in making such a modification.*** MPEP § 2143.02 (*citing* In re Merck & Co., 800 F.2d 1091 (Fed. Cir. 1986)(holding that a reasonable expectation of success is required for a modification of a reference in view of another to be proper)). It is applicant's contention that the teaching of the prior art, when taken properly as a whole, would not give one of ordinary skill in the art a reasonable expectation of success, and therefore the requisite motivation for modifying Ying et al. in view of Moise et al. does not exist. Therefore the combination of the references is improper.

Accordingly, the pending claims are non-obvious over the cited art, and withdrawal of the rejection is therefore respectfully requested.

ii. Ying et al. and Moise et al. do not teach a PZT etch with BCl3 and Cl2 in a range of ratios from 1:4 to 10:1, respectively, as recited in claims 3 and 6, and it would not be obvious to obtain such ratios by routine experimentation because the recited ratio range is not a result-effective variable.

In maintaining the rejection of claims 3 and 6, the Office Action states that the applicant has not met a showing that changes within the ratio ranges would not affect the etching result. It is respectfully submitted that this is the inappropriate standard in evaluating the patentability of the claims. MPEP § 2144.05 (II) discusses the issue of optimization of ranges. While if general conditions are disclosed in the prior art then it is not inventive to identify optimum ranges, ***there is no general teaching in either prior art reference that a variation in the ratio is relevant to sidewall profile.*** That is why the MPEP cites to case law that ***in order to obviate a claim range based on routine experimentation, the variable in question must first be recognized as a results-effective variable***. The MPEP unambiguously defines the term as "a variable which achieves a recognized result." MPEP § 2144.05 (II)(B). The Office Action has provided no evidence to show that the ratio of BCl3 and Cl2 is a result-effective variable, and the applicant is under no duty to prove the converse. More particularly, ***Ying et al. do not provide any mention of BCl3 and Cl2 for etching the ferroelectric dielectric layer. Concurrently, Moise et al. provides no teaching that the ratio of etchants impacts the sidewall profile of the capacitor stack.*** Consequently, prior to applicant's disclosure, there is no evidence that anyone appreciated the impact of the ratio of the claimed etchants on sidewall profile, and the claimed range provides for significant performance advantages over the prior art. Therefore claims 3 and 6 are non-obvious over the cited art. Accordingly, withdrawal of the rejection of claims 3 and 6 is respectfully requested.

II. NEWLY ADDED CLAIMS 18-24

Newly added claims 18-24 were provided in the submission that accompanied the RCE. While the claims were listed as being rejected, no substantive examination of the claims appears to have taken place. More particularly, no remarks were provided in the Office Action regarding what portions of the cited art read on the pending claims. Applicant respectfully requests further detail regarding these claims.

III. CONCLUSION

For at least the above reasons, the claims currently under consideration are believed to be in condition for allowance.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should any fees be due as a result of the filing of this response, the Commissioner is hereby authorized to charge the Deposit Account Number 20-0668, TI-34580.

Respectfully submitted,
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CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Assistant Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: December 12, 2006

Christine Gillroy
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